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Aid, Debt Burden and Government Fiscal Behaviour in Côte d'Ivoire

by

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Abstract
This paper examines the impact of foreign aid on public sector fiscal behaviour in Côte d'Ivoire. A special interest is the relationship between aid, debt servicing and debt, given that Côte d'Ivoire is a highly indebted country. The theoretical model employed differs from those of previous studies by highlighting the interaction between debt servicing and the other fiscal variables. This model is estimated using 1975-99 time series data. Key findings are that the bulk of aid is allocated to debt servicing and that aid is associated with increases in the level of public debt.

Outline

1. INTRODUCTION

In recent years the focus of the aid effectiveness debate has moved away from the traditional saving and foreign exchange gap theories to the institutional and policy gaps (Burnside and Dollar, 2000). This new literature emphasises on the importance of good policies as a precondition not only for the working of aid but also for aid allocation. Put in differently it is argued that aid is only effective, in promoting growth, in countries with good policy environments and, therefore, donors should target these countries with their aid. This argument was echoed loudly in the much-discussed *Assessing Aid* (World Bank 1998). However, Lensink and White (1999) and Hansen and Tarp (2000 and 2001), among others, have questioned the above conclusions on several grounds, with Hansen and Tarp (2001) finding that the impact of aid on growth is not conditional on good policies. This debate in the literature remains unsettled.

One of the shortcomings of the aid-growth literature - the main focus of most aid effectiveness studies - is that it overlooks the fact that aid is given primarily to the government and therefore any macroeconomic impact will depend on the public sector fiscal behaviour (McGillivray, 1994; Franco-Rodriguez *et al*., 1998; McGillivray and Morrissey, 2001; Mavrotas, 2002). One area of the wider aid effectiveness debate has attempted to look at how foreign aid inflows affect recipient government fiscal behaviour. Two main approaches have been adopted in this literature. The first approach is uniquely concerned with fungibility, which arises if recipients have the ability to use aid for purposes other than those for which donors provided it. This issue has been discussed extensively in *Assessing Aid* where it is argued '…donors should take it for granted that their aid is fungible because that is the reality' (World Bank, 1998, p.80). Well-known empirical studies that deal with the issue of fungibility include Pack and Pack (1990 and 1993), Khilji and Zampelli (1994) and Feyzioglu *et al*. (1998). The second approach addresses the fiscal impact of aid in a much broader context. It goes beyond aid's impact on expenditure types to look at how other sources of revenue (tax and borrowing) are affected by these inflows. This area of research, known as the fiscal response literature, has received increasing attention since the seminal contribution of Heller (1975). Studies such as Mosley *et al.* (1987), Gang and Khan (1991) and more recently Franco-Rodriguez *et al*. (1998), McGillivray and Ahmed (1999), Franco-

Rodriguez (2000), McGillivray (2000) and Mavrotas (2002) have all addressed the issue.

This paper applies a fiscal response model to look at the interactions between aid and government fiscal behaviour in Côte d'Ivoire during 1975-99. Côte d'Ivoire is an interesting case study, as annual debt servicing constitutes approximately 40 percent of all government expenditure and absorbs more than half of its domestic revenue (Ministère de l'Economie et des Finances, 1997). The fiscal response model used in the paper differs significantly from those previously applied, in recognition of this fact, by identifying interaction between debt service expenditure and other fiscal aggregates, including aid. A further departure from previous research is that the model's parameters are estimated in a way which ensures that all estimates are consistent with the theoretical model. This important point, as it will become clear later, has been overlooked by most previous studies. A key finding of this paper is that a large part of foreign aid is used for public debt servicing rather than other areas of government expenditure. Another key finding is that aid inflows do not reduce the level of debt in Côte d'Ivoire; this conflicts with conventional wisdom that aid and debt are substitutes.

The remainder of this paper is organised as follows. Section II outlines the fiscal response model used in this paper, highlighting its differences to previous such models. In Section III, the model in the previous section is then modified to account for the debt issue. Section IV discusses data issues and the econometric method used in the estimation process. Section VI presents the results and their interpretations. Concluding remarks and policy recommendations are provided Section VII.

2. A FISCAL RESPONSE MODEL

Fiscal response studies assume that public sector decision makers are faced with the task of allocating resources among expenditure types subject to budgetary constraints. These decision makers are further assumed to behave as if they were a single individual with a well-behaved, homothetic preference map and with the following utility function:

$$U = f(I_G, G, T, A, B) \tag{1}$$

where I_G represents public investment expenditure, G is government consumption expenditure, T is tax and other recurrent domestic revenue, A is net foreign aid disbursements (comprising grants and net aid loans) and B is net borrowing from other sources. All variables are for period t. Equation (1) is that posited by Franco-Rodriguez *et al.* (1998). Various representations of this equation have been used in the literature, with some studies, for example, disaggregating G into recurrent and socioeconomic consumption expenditure or A into grants and loans. The interest of the current study is in debt servicing. In (1) this variable will be imbedded within A and B, but will clearly require a separate treatment for countries with relatively high levels of debt servicing. We therefore replace (1) with the following utility function:

$$U = f(E, D, T, A, B) \tag{2}$$

where E is both government investment and consumption expenditure, D is public debt servicing, T is tax and other recurrent domestic revenue, A foreign aid disbursements (grants and *gross* aid loans) is tax and other recurrent domestic revenue and B is *gross* borrowing from all other sources. I_G and G have been aggregated to form E to make the model empirically tractable given degrees of freedom issues[1]

The standard approach in the fiscal response literature is to write the public sector utility function as a quadratic loss function, which assumes that decision makers set annual targets for each expenditure and revenue variable and consciously strive to achieve these targets. We see no reason to depart from this approach and therefore write (2) as follows:

$$U = \alpha_0 - \frac{\alpha_1}{2}(E - E^*)^2 - \frac{\alpha_2}{2}(D - D^*)^2 - \frac{\alpha_3}{2}(T - T^*)^2$$
$$- \frac{\alpha_4}{2}(A - A^*)^2 - \frac{\alpha_5}{2}(B - B^*)^2 \tag{3}$$

where the starred variables represent exogenous targets and $\alpha_i > o$, $\forall\, i = 1, \ldots, 5$. Utility function (3) as defined above implies that each year the government sets its targets for I_G, G, T, A, and B and maximises its utility by trying to achieve these targets and any deviation from these targets results in a loss in utility. It follows that (3) reaches a

maximum at α_0. A fuller discussion of the general form of (3) can be found in Binh and McGillivray (1993), Franco-Rodriguez *et al.* (1998) and Mavrotas (2002).

Broadly following Franco-Rodriguez *et al.* (1998), the policy maker is assumed to maximise utility function (2) subject to the following budget constraints:

$$E + D = T + A + B \tag{4}$$

$$D \leq \rho_1 T + \rho_2 A + \rho_3 B \tag{5}$$

where ρ_1, ρ_2, and ρ_3 are the proportions of taxes, aid, and borrowing allocated to debt servicing, respectively. Consequently, given that the model contains two categories of expenditure (E and D), $(1-\rho_1)$, $(1-\rho_2)$, and $(1-\rho_3)$ the proportions of tax, aid and borrowing directed towards public investment and consumption expenditure. Equation (4) is simply the government=s overall budget constraint which must always hold. The rationale for the inequality written in (5) is that there are *external* constraints which limit the manner in which the public sector in developing countries allocates revenues. The actions of donors or domestic interests cause the values of the ρs in (5) to be imposed on those involved in setting targets and allocating revenue, with there being no guarantee that targets can be met even though revenues may satisfy (4). In other words, on the assumption that (5) is binding (the possible value of D is upper bound), these external constraints prevent the attainment of α_0 because at least one expenditure target cannot be met. Our analysis is premised on this assumption. If (5) is not binding the government is able to reach its expenditure targets, utility is maximised subject to (4) only and the government can attain α_0 if revenues are sufficient.

As is the tradition in practically all fiscal response studies we assume *ex ante* that targeted domestic borrowing B^*, albeit gross borrowing in the present case, is equal to zero. Maximising (3) subject to (4) and (5) with $B^* = 0$ yields the following system of structural equations:

---

1 A useful extension of the model, ruled out on the grounds, is disaggregation of the aid variable following Mavrotas (2002).

$$
\begin{aligned}
E = {} & (1-\rho_1)\beta_1 E^* + (1-\rho_1)\beta_2 D^* \\
& +(1-\rho_1)[1-(1-\rho_1)\beta_1 - \rho_1\beta_2]T^* \\
& +[(1-\rho_2)-(1-\rho_1)(1-\rho_2)\beta_1 - (1-\rho_1)\rho_2\beta_2]A \\
& +[(1-\rho_3)-(1-\rho_1)(1-\rho_3)\beta_1 - (1-\rho_1)\rho_3\beta_2]B
\end{aligned} \tag{6}
$$

$$
\begin{aligned}
D = {} & \rho_1\beta_1 E^* + \rho_1\beta_2 D^* + \rho_1[1-(1-\rho_1)\beta_1 - \rho_1\beta_2]T^* \\
& +[\rho_2 - \rho_1(1-\rho_2)\beta_1 - \rho_1\rho_2\beta_2]A \\
& +[\rho_3 - \rho_1(1-\rho_3)\beta_1 - \rho_1\rho_3\beta_2]B
\end{aligned} \tag{7}
$$

$$
\begin{aligned}
T = {} & \beta_1 E^* + \beta_2 D^* + [1-(1-\rho_1)\beta_1 - \rho_1\beta_2]T^* \\
& -[(1-\rho_2)\beta_1 + \rho_2\beta_2]A \\
& -[(1-\rho_3)\beta_1 + \rho_3\beta_2]B
\end{aligned} \tag{8}
$$

$$
\begin{aligned}
A = {} & \beta_3 E^* + \beta_4 D^* - [(1-\rho_1)\beta_3 + \rho_1\beta_4]T \\
& +[1-(1-\rho_2)\beta_3 - \rho_2\beta_4]A^* \\
& -[(1-\rho_3)\beta_3 + \rho_3\beta_4]B
\end{aligned} \tag{9}
$$

$$
\begin{aligned}
B = {} & \beta_5 E^* + \beta_6 D^* - [(1-\rho_1)\beta_5 + \rho_1\beta_6]T \\
& -[(1-\rho_2)\beta_5 + \rho_2\beta_6]A
\end{aligned} \tag{10}
$$

where

$$
\begin{aligned}
& \beta_1 = \frac{\alpha_1(1-\rho_1)}{\theta_1};\ \beta_2 = \frac{\alpha_2\rho_1}{\theta_1};\ \beta_3 = \frac{\alpha_1(1-\rho_2)}{\theta_2};\ \beta_4 = \frac{\alpha_2\rho_2}{\theta_2};\ \beta_5 = \frac{\alpha_1(1-\rho_3)}{\theta_3};= \beta_6 = \frac{\alpha_2\rho_3}{\theta_3} \\
& \theta_1 = \alpha_1(1-\rho_1)^2 + \alpha_2\rho_1^2 + \alpha_3; \\
& \theta_2 = \alpha_1(1-\rho_2)^2 + \alpha_2\rho_2^2 + \alpha_4 \\
& \theta_3 = \alpha_1(1-\rho_3)^2 + \alpha_2\rho_3^2 + \alpha_5
\end{aligned}
$$

.

Solving the system of structural equations (6)-(10) leads to the following reduced form equations, where each endogenous variable in (3) is expressed in terms of the exogenous variables represented by the target variables:

$$E = \delta_1 E^* + \delta_2 D^* + \delta_3 T^* + \delta_4 A^* \tag{11}$$

$$D = \delta_5 E^* + \delta_6 D^* + \delta_7 T^* + \delta_8 A^* \tag{12}$$

$$T = \delta_9 E^* + \delta_{10} D^* + \delta_{11} T^* + \delta_{12} A^* \tag{13}$$

$$A = \delta_{13} E^* + \delta_{14} D^* + \delta_{15} T^* + \delta_{16} A^* \tag{14}$$

$$B = \delta_{17} E^* + \delta_{18} D^* + \delta_{19} T^* + \delta_{20} A^* \tag{15}$$

where the δs are combinations of ρs, from equation (5) and αs from utility function written in (3). The coefficients of interest are those relating the total impact of aid on the endogenous variables. The composition of these coefficients is as follows:

$$\delta_4 = \left[\frac{\gamma_3 - \rho_2 \gamma_2}{\alpha_1(\gamma_1 \gamma_3 - \gamma_2^2)} \right]; \delta_8 = \left[\frac{(\gamma_3 - \gamma_2) + \rho_2(\gamma_1 - \gamma_2)}{\alpha_2(\gamma_1 \gamma_3 - \gamma_2^2)} \right]; \delta_{12} = -\left[\frac{(\gamma_3 - \rho_1 \gamma_2) + \rho_2(\rho_1 \gamma_1 - \gamma_2)}{\alpha_3(\gamma_1 \gamma_3 - \gamma_2^2)} \right];$$

$$\delta_{16} = \left[1 - \frac{(\gamma_3 - \rho_2 \gamma_2) + \rho_2(\rho_2 \gamma_1 - \gamma_2)}{\alpha_4(\gamma_1 \gamma_3 - \gamma_2^2)} \right]; \delta_{20} = -\left[\frac{(\gamma_3 - \rho_3 \gamma_2) + \rho_2(\rho_3 \gamma_1 - \gamma_2)}{\alpha_5(\gamma_1 \gamma_3 - \gamma_2^2)} \right].$$

$$\gamma_1 = \frac{1}{\alpha_2} + \frac{1}{\alpha_2} + \frac{1}{\alpha_3} + \frac{1}{\alpha_4} + \frac{1}{\alpha_5};$$

$$\gamma_2 = \frac{1}{\alpha_2} + \frac{\rho_1}{\alpha_3} + \frac{\rho_2}{\alpha_4} + \frac{\rho_3}{\alpha_5};$$

$$\gamma_3 = \frac{1}{\alpha_2} + \frac{\rho_1^2}{\alpha_3} + \frac{\rho_2^2}{\alpha_4} + \frac{\rho_3^2}{\alpha_5}$$

3. DATA ISSUES AND ESTIMATION METHOD

The structural and reduced form equation parameters were estimated using time-series data for Côte d'Ivoire for the period of 1975-1999. All variables are expressed in billions of CFA Francs at constant 1995 prices. Data on gross foreign aid disbursements (*A*) were obtained from the OECD online database. McGillivray and Morrissey (2000, 2001) note that these data are a donor measure of aid and may not always correspond to the flows of funds into the recipient country fiscal budget. In the present context data availability dictated using the OECD aid statistics. Data for annual debt service (*D*), government expenditure (*E*), tax revenues (*T*) and income Y were obtained from the *African Live Data* and the *African Development Indicators*. Debt service data includes

both payments made on domestic and external debt. Data for gross borrowing is obtained as a residual calculated as the difference between total expenditure (*E* and *D*) and the other sources of revenue (*T* and *A*), as is standard practice in the fiscal response literature.

The estimation procedure consists of three stages. Firstly, like most fiscal response studies, the targets variables are approximated, as data on these variables could not be obtained directly. These targets are estimated as a long-run relationship where it was possible to find a cointegrating regression between the target variable and some explanatory variables. When it is not possible to establish such cointegrating relationship, like Franco-Rodriguez (2000), the targets are approximated using autoregressive techniques. The target for foreign aid disbursement is set equal to aid commitments, following Franco-Rodriguez *et al*. (1998) and McGillivray and Ahmed (1999). The targets, in logarithmic terms, are expressed as follows, with standard errors in brackets.

$$LT^* = \underset{(3.102)}{5.01} + \underset{(0.039)}{0.477}LY - \underset{(0.074)}{0.358}LA^* \tag{16}$$

$$LE^* = \underset{(0.26)}{4.84} + \underset{(0.08)}{0.382}LE_{-1} \tag{17}$$

$$LD^* = \underset{(0.58)}{1.99} + \underset{(0.09)}{0.70}LD_{-1} \tag{18}$$

The variables T^*, E^* and D^* are then obtained by taking the exponential values of LT^*, LE^* and LD^* of the estimation of the structural equations the exponential of the targets, expressed in logarithm terms, was taken. The borrowing target (B^*), as already mentioned, is set equal to zero.

In the second stage of the estimation, the structural equations (6)-(10) are estimated using the non-linear three-stage least squares technique. Given that the system is simultaneous and contains cross-equation restrictions with respect to the ρs and βs, this

technique is appropriate (McGillivray, 2000). Finally, the system of structural equations, obtained from the previous stage, is solved to get the reduced form parameters.

Before going to analyse report estimates it is important to stress two important points that have been largely overlooked in the fiscal response literature. Not addressing these points can lead to seriously misleading conclusions, as is shown later in this paper. The first relates to ρ_1, ρ_2, and ρ_3, which as pointed out earlier, are proportions of tax, aid and borrowing allocated to debt repayments, respectively. Given that these parameters are proportions their estimates must lie within the range of zero and one, as McGillivray and Morrissey (2000) observe. A government cannot allocate a negative share of taxes, aid or borrowing to an expenditure area. Nor can it cannot allocate more than 100 percent of these variables to an expenditure area. Most previous fiscal response models have failed to recognise this important point. For example, Heller (1975), Gang and Khan (1991), and Mavrotas (2002) have all reported ρs which are either negative or greater than one.

The second point relates to the βs. All fiscal response studies, with the exception of McGillivray and Ahmed (1999) and McGillivray (2000), report negative values of these parameters. But the theoretical model does not permit this, a point previously overlooked in the literature. The αs must be greater than zero to ensure diminishing utility if the government deviates from the targets. This, combined with the fact that the ρs lie between zero and one, dictates that θ_1, θ_2 and θ_3 are each positive. In this case, looking at the expressions of each of the βs, it is also clear that their estimates must be positive if the estimated model is to be consistent with the theoretical model.

The response to these two estimation issues is straightforward. One can simply impose the theoretical restrictions during estimation, as most econometric software packages permit. The ρs were restricted to lie between the range of zero and one and the βs were restricted to be equal to or greater than zero. Failing to impose these restrictions can lead to seriously misleading conclusions, as is shown below. [2]

4. RESULTS AND INTERPRETATION

Results obtained from estimating the structural equations, with restrictions imposed, are shown in Table 1. As it can be seen from this table, ρ_1, ρ_2 and ρ_3 are all within their theoretical range. Also, the estimates of the βs parameters all positive as expected. As such the econometric estimates satisfy the theoretical model one can confidently interpret the results. The estimates of the constraint equation parameters, ρ_1, ρ_2 and ρ_3, are respectively 0.285, 0.622 and 0.00. These results indicate that around 29 of tax revenue and more than 60 percent of aid disbursements are used for debt repayments in the case of Côte d'Ivoire, and that none of the borrowing is used for debt servicing. What is more, contrary to the studies of Griffin (1970), Boone (1996), and more recently (World Bank 1998), which argue that much foreign aid is used to finance government consumption, the estimate of ρ_2 also indicates that debt servicing and not consumption is main destination of aid funds. This finding confirms earlier results by Pack and Pack (1993) who found that around 88 cents per dollar of aid is used for debt servicing in the context of The Dominican Republic.

Table 1: ***Estimates of Structural Parameters with Restrictions***

Parameter	Estimate	t statistic
ρ_1	0.285***	13.70
ρ_2	0.622***	6.19
ρ_3	0.000***	3.12
β_1	1.366***	6.94
β_2	0.256*	1.89
β_3	0.000	0.04
β_4	0.011	0.45
β_5	1.500***	2.64
β_6	0.724***	3.12

***,**,*: significantly different from zero at 99, 95 and 90 percent levels, respectively.

2 Further estimation details can be obtained from the authors. Note that we do not attempt to take account of the time series properties of the data in this stage of the estimation, as there is currently no known way of doing so in the context of non-linear systems estimation.

Estimates of the structural equations without restrictions imposed are shown in Table 2. Two of the three ρs and three of the βs are negative, and very different conclusions would emerge from these results regarding the impact of aid and the interaction of the fiscal variables in general. The approach of imposing restrictions on the non-linear three stage least squares estimation would therefore seem justified.

Table 2: ***Estimates of Structural Parameters without Restrictions***

Parameter	Estimate	t statistic
ρ_1	-0.566***	-9.28
ρ_2	0.311	1.18
ρ_3	-0.792***	-72.90
β_1	1.169***	-13.92
β_2	0.505***	-3.80
β_3	-0.005	-0.06
β_4	0.105	0.91
β_5	-1.225***	-5.28
β_6	-0.851***	-6.25

***: significantly different from zero at 99 percent level.

The estimates of the β_i s do not have a straightforward interpretation, but they allow us to determine the estimates of the structural equations when combined with the ρ_i s. Table 3 summaries the direct incremental impact of endogenous changes in the revenue variables. Parameters that are insignificantly different from zero are set to zero in calculating the different impacts, following McGillivray (2002). Foreign aid disbursements have a positive impact on debt servicing. Each CFA Franc increase in aid results in an increase in debt repayments of almost half that amount. This confirms an earlier finding (made in this paper) that large share of aid inflows are used for debt service. Aid appears to have a small negative direct incremental impact on government expenditure. With regard to tax and borrowing, results in Table 3 indicate that aid inflows discourage taxation efforts, and that the government substitutes borrowing for aid on a one-to-one basis.

Table 3: ***Direct Incremental Impacts of Revenue Variables***

Impact	Mechanism	Estimate
A on D	$[\rho_2 - \rho_1(1-\rho_2)\beta_1 - \rho_1\rho_2\beta_2]$	0.43
A on E	$[(1-\rho_2) - (1-\rho_1)(1-\rho_2)\beta_1 - (1-\rho_1)\rho_2\beta_2]$	-0.11
A on T	$-[(1-\rho_2)\beta_1 + \rho_2\beta_2]$	-0.68
A on B	$-[(1-\rho_2)\beta_5 + \rho_2\beta_6]$	-1.02
B on D	$[\rho_3 - \rho_1(1-\rho_3)\beta_1 - \rho_1\rho_3\beta_2]$	-0.39
B on E	$[(1-\rho_3) - (1-\rho_1)(1-\rho_3)\beta_1 - (1-\rho_1)\rho_3\beta_2]$	0.02
B on T	$-[(1-\rho_3)\beta_3 + \rho_3\beta_4]$	-1.37
B on A	$-[(1-\rho_1)\beta_3 + \rho_1\beta_4]$	-0.00
T on A	$-[(1-\rho_1)\beta_3 + \rho_1\beta_4]$	-0.03
T on B	$-[(1-\rho_1)\beta_5 + \rho_1\beta_6]$	-1.28

The fiscal response model can also be used to assess the impacts of domestic and other revenues, gross borrowing in this case, on public sector fiscal aggregates. From Table 3 it follows that the direct impacts of increases in borrowing are a reduction in debt servicing and an increase in government expenditure. This is another indication that the Ivorian government borrows to finance government expenditure and not to service its debt. Turning to taxation the evidence shows that an increase in borrowing is compensate by a decrease in taxation. Aid disbursements, on the other, barely respond to changes in borrowing. With regard to the direct impact of taxes the results show that increases in taxes are offset by decreases in borrowing. What is more, borrowing decreases by more than the increase in taxation, thus implying increasing taxation effort would help cut borrowing considerably. Borrowing and taxation affects each other by almost the same magnitude, thus implying the Ivorian authorities would substitute one for the other.

As mentioned earlier, the results related to the structural equations only show the direct, and therefore partial, impacts of the revenue variables on each endogenous variable. Total impacts are captured by the estimates of the reduced form equations. Table 4 shows reduced form equation parameters relating to the total impact of aid, our prime

interest.[3] These parameters suggest that the total impact of a 1000 CFA franc increase in aid is a 340 francs increase on debt servicing, thus confirming the above finding that part of the aid to Côte d'Ivoire is used to reduce the debt burden. Government expenditure does not appear to increase following increases in aid inflows. Turning to taxation and other recurrent revenue, the results indicate that, for every 1000 francs increase in aid revenue would fall by 920 francs. Given that the reduction in revenue is greater than the reduction expenditure it can be deduced that the total impact of aid on public saving is negative. Judging from the estimate of the total impact of aid on borrowing it is clear that contrary to the general belief, aid inflows do not lead to a reduction in borrowing. Similar findings are reported by Franco-Rodriguez et *al*. (1998) in the case of Pakistan and Feeny and McGillivray (2001) for a cross-section of developing countries. One of the reasons why, in the case of Côte d'Ivoire, borrowing might not decrease following increases in aid is that, while borrowing is used to support government expenditure (investment and consumption), foreign aid is used to finance the huge debt servicing burden and not reductions in gross debt. With regard to aid, the evidence shows that around 96 percent of aid commitments to Côte d'Ivoire are disbursed; Ivorian authorities would appear to have a high degree of bargaining power in convincing donors to release committed aid funds.

Table 4: ***Estimates of Total Impacts of Aid***

Impact	Estimate
A on D	0.34
A on E	-0.10
A on T	-0.92
A on B	0.20
A on A	0.96
T on A	-0.02
T on B	-0.10

3 All other reduced form parameters are available on request from the authors.

5. CONCLUSION AND POLICY IMPLICATIONS

This paper tried to analyse the effects of aid inflows on the public sector fiscal behaviour in Côte d'Ivoire for the period of 1975-99. It contributes to the existing fiscal response literature on two grounds. Firstly, it uses a model that takes into account an important element of most developing countries fiscal activities, that is, the debt issue, which has been overlooked by most fiscal response studies. Secondly, on the estimation front, the paper derives econometric estimates that are consistent with the theoretical settings of the model, and thus, provides more reliable estimates with regard to the different impacts of foreign aid.

One of the key findings of this paper is that a large proportion of aid to Côte d'Ivoire is used for debt servicing. This may be one of the reasons why many aid effectiveness studies have failed to establish a strong relation between aid and growth. Turning to taxation, aid seems to induce decrease in taxation effort and worse a decrease in public savings. Nonetheless, this decrease in public savings may be offset by an increase in private savings, as the reduction in taxes could benefit the private sector. Another finding of this paper is the fact that aid does not appear to induce reduction in borrowing. Most borrowing, it was found, is used to finance government expenditure on investment and consumption.

The policy recommendation of this paper, based on the above evidence, is given that the debt burden pulls resources (aid in particular) away from domestic expenditure (including investment) donors should help Côte d'Ivoire and other HIPCs in alleviating the burden in order to make aid work more effectively. One solution to the problem would be to allocate aid (in the form of more grants) not on the ground of good policy environment, as argued by Burnside and Dollar (2000) and *Assessing Aid*, but relative to the size of debt burden. This could help developing countries grow out of their debt. Another solution could be the expansion of developing countries' exports revenues through the adoption of fair trade policies by the advanced countries. Finally, debt forgiveness could also be a useful tool in helping the poor countries in removing the constraints imposed by debt servicing on the domestic economy.

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